THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants:	Kastenmayer, et al.
Appl. No.:	10/523,767
Conf. No.:	7519
Filed:	February 7, 2005
Title:	CALCIUM ABSORPTION ENHANCER
Art Unit:	1784
Examiner:	Hong T. Mehta
Docket No.:	3712036-00444

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' APPEAL BRIEF

Sir:

Appellants submit this Appeal Brief in support of the Notice of Appeal filed on August 2, 2010. This Appeal is taken from the Final Rejection dated April 19, 2010 and the Advisory Action dated July 27, 2010.

I. REAL PARTY IN INTEREST

The real parties in interest for the above-identified patent application on Appeal are Peter Kastenmayer, Denis Barclay, Elizabeth Offord Cavin and Sylvie Pridmore-Merten.

II. RELATED APPEALS AND INTERFERENCES

Appellants' legal representative and the Assignee of the above-identified patent application do not know of any prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision with respect to the above-identified Appeal.

III. STATUS OF CLAIMS

Claims 1, 3, 6-11 and 26-27 are pending in the above-identified patent application. Claims 2, 5, 12-23, 25 and 28-32 were previously withdrawn from consideration, and Claims 4 and 24 were previously canceled without prejudice or disclaimer. Claims 1, 3, 6-11 and 26-27 stand rejected. Therefore, Claims 1, 3, 6-11 and 26-27 are being appealed in this Brief. A copy of the appealed claims is included in the Claims Appendix.

IV. STATUS OF AMENDMENTS

A Non-Final Office Action was mailed on July 10, 2009, in which the Examiner rejected Claims 1, 3, 6-11, 26 and 27 under 35 U.S.C. §103. Appellants filed a Response to the Non-Final Office Action on January 11, 2010, in which Appellants argued against the obviousness rejections. A Final Office Action was mailed on April 19, 2010, in which the Examiner maintained the rejections of Claims 1, 3, 6-11, 26 and 27 under 35 U.S.C. §103. Appellants filed a Response to the Final Office Action on July 12, 2010, in which Appellants argued against the obviousness rejections and amended the claims for clarification purposes. An Advisory Action was sent by the Examiner on July 27, 2010, in which the Examiner refused to enter the clarifying amendments. Appellants filed a Notice of Appeal on August 2, 2010. Copies of the Non-Final Office Action, Final Office Action, and Advisory Action are included in the Evidence Appendix as Exhibits A, B and C, respectively.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A summary of the invention by way of reference to the specification (WO 2004/014155) and/or figures for each of the independent claims is provided as follows:

Independent Claim 1 is directed to calcium absorption enhancers (page 5, lines 16-20; page 6, lines 5-25) comprising as an active ingredient calcium (page 6, lines 5-25), at least one isoflavone (page 6, lines 5-25) and egg white (page 6, lines 5-25), wherein the ratio of egg white/calcium is between 20 to 60 by weight (page 8, lines 2-8).

Independent Claim 6 is directed to orally ingestible compositions comprising a calcium absorption enhancer (page 5, lines 16-20; page 6, lines 5-25) comprising as an active ingredient calcium (page 6, lines 5-25), at least one isoflavone (page 6, lines 5-25) and egg white (page 6, lines 5-25), wherein the ratio of egg white/calcium is between 20 to 60 by weight (page 8, lines 2-8).

Although specification citations are given in accordance with C.F.R. 1.192(c), these reference numerals and citations are merely examples of where support may be found in the specification for the terms used in this section of the Brief. There is no intention to suggest in any way that the terms of the claims are limited to the examples in the specification. As demonstrated by the references numerals and citations below, the claims are fully supported by the specification as required by law. However, it is improper under the law to read limitations from the specification into the claims. Pointing out specification support for the claim terminology as is done here to comply with rule 1.192(c) does not in any way limit the scope of the claims to those examples from which they find support. Nor does this exercise provide a mechanism for circumventing the law precluding reading limitations into the claims from the specification. In short, the references numerals and specification citations are not to be construed as claim limitations or in any way used to limit the scope of the claims.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1, 3, 6-11, 26 and 27 are rejected under 35 U.S.C. §103(a) as being unpatentable over JP 7308172 to Kaisha ("*Kaisha*") in view of U.S. Patent No. 5,424,331 to Shlyankevich et al. ("*Shlyankevich*") and further evidenced by Nutrition Almanac, 1973 to Kirschmann ("*Kirschmann*"). Copies of *Kaisha*, *Shlyankevich*, and *Kirschmann* are included in the Evidence Appendix as Exhibits D, E and F, respectively.

VII. ARGUMENT

A. LEGAL STANDARDS

Obviousness under 35 U.S.C. §103

The Federal Circuit has held that the legal determination of an obviousness rejection under 35 U.S.C. § 103 is:

> whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made…The foundational facts for the prima facie case of obviousness are: (1) the scope and content of the prior art; (2) the difference between the prior art and the claimed invention; and (3) the level of ordinary skill in the art…Moreover, objective indicia such as commercial success and long felt need are relevant to the determination of obviousness…Thus, each obviousness determination rests on its own facts.

In re Mayne, 41 U.S.P.Q. 2d 1451, 1453 (Fed. Cir. 1997).

In making this determination, the Patent Office has the initial burden of proving a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q. 2d 1955, 1956 (Fed. Cir. 1993). This burden may only be overcome "by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings." *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). "If the examination at the initial stage does not produce a prima facie case of unpatentability, then without more the applicant is entitled to grant of the patent." *In re Oetiker*, 24 U.S.P.Q. 2d 1443, 1444 (Fed. Cir. 1992).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference or references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Fine*, 837 F.2d 1071, 5, U.S.P.Q.2d 1596 (Fed. Cir. 1988). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Finally, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q., 580 (CCPA 1974).

Further, the Federal Circuit has held that it is "impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the

claimed invention is rendered obvious." *In re Fritch*, 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992). "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988).

Moreover, the Federal Circuit has held that "obvious to try" is not the proper standard under 35 U.S.C. §103. *Ex parte Goldgaber*, 41 U.S.P.Q.2d 1172, 1177 (Fed. Cir. 1996). "An-obvious-to-try situation exists when a general disclosure may pique the scientist curiosity, such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued." *In re Eli Lilly and Co.*, 14 U.S.P.Q.2d 1741, 1743 (Fed. Cir. 1990).

Of course, references must be considered as a whole and those portions teaching against or away from the claimed invention must be considered. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve Inc.*, 796 F.2d 443 (Fed. Cir. 1986). "A prior art reference may be considered to teach away when a person of ordinary skill, upon reading the reference would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the Applicant." *Monarch Knitting Machinery Corp. v. Fukuhara Industrial Trading Co., Ltd.*, 139 F.3d 1009 (Fed. Cir. 1998), quoting, *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994).

B. THE CLAIMED INVENTION

Independent Claim 1 is directed to calcium absorption enhancers. The calcium absorption enhancers include, as an active ingredient, calcium, at least one isoflavone, and egg white. The ratio of egg white/calcium is between 20 to 60 by weight.

Independent Claim 6 is directed to orally ingestible compositions. The orally ingestible compositions include a calcium absorption enhancer including, as an active ingredient, calcium, at least one isoflavone, and egg white. The ratio of egg white/calcium is between 20 to 60 by weight.

C. THE REJECTION OF CLAIMS 1, 3, 6-11 AND 26-27 UNDER 35 U.S.C. §103(a) SHOULD BE REVERSED BECAUSE THE CITED REFERENCES FAIL TO DISCLOSE OR SUGGEST EACH AND EVERY ELEMENT OF THE PRESENT CLAIMS

Appellants respectfully submit that the obviousness rejection of Claims 1, 3, 6-11 and 26-27 should be reversed because the Examiner failed to establish a *prima facie* case of obviousness. In the Office Action, the Examiner alleged that the combination of *Kaisha, Shlyankevish* and *Kirschmann* renders the claimed subject matter obvious. However, the Examiner fails to establish a *prima facie* case of obviousness because the cited references fail to teach or suggest every element of the claimed invention. Further, the skilled artisan would have no reason to combine the cited references to arrive at the present claims.

1. The Cited References Fail to Disclose Each and Every Element of the Present Claims

Independent Claims 1 and 6 recite, in part, calcium absorption enhancers comprising calcium, at least one isoflavone and egg white, wherein the ratio of egg white/calcium is between 20 to 60 by weight. In contrast, Appellants respectfully submit that the cited references alone or in combination fail to disclose or suggest each and every element of independent Claims 1 and 6.

Appellants have found that giving calcium and/or isoflavones in parallel with egg white considerably enhances calcium absorption. See, Preliminary Amendment, page 8, lines 10-16. Indeed, Appellants have surprisingly found that by giving egg white together with calcium, the absorption of calcium was significantly enhanced. Although not wishing to be bound by theory, Appellants believe that the phenomenon may be due to egg whites and isoflavones stabilizing the emulsion of calcium, preventing it from precipitating, or egg whites transformed into peptides during digestion, and these peptides help to keep calcium soluble in the intestine. See, Preliminary Amendment, page 8, lines 10-16.

Further, isoflavones (e.g., soy isoflavones) are weak estrogens. They are 1000 fold less potent than natural estrogen. However, in women consuming a soy diet, circulating plasma levels of isoflavones are 1000 fold higher than estradiol and result in physiological effects. By analogy with estrogen, it is postulates that soy isoflavones, which bind to estrogen receptors

(ERs), though with a higher affinity for ERβ than ERα, may modulate gastrointestinal absorption and renal tubular reabsorption of calcium. See, Preliminary Amendment, page 7, lines 5-14; page 8, line 17-page 9, line 11. In contrast, Appellants respectfully submit that *Kaisha*, *Shlyankevich* and *Kirschmann,* alone or in combination, fail to disclose or suggest a number of elements of the present claims.

For example, *Kaisha*, *Shlyankevich* and *Kirschmann,* alone or in combination, fail to disclose or suggest a calcium absorption enhancer comprising calcium, at least one isoflavone and egg white as required by Claims 1 and 6. *Kaisha*, *Shlyankevich* and *Kirschmann,* alone or in combination, also fail to disclose or suggest a calcium absorption enhancer comprising a weight ratio of egg white/calcium between 20 to 60 as required by Claims 1 and 6. Instead, and at best, *Kaisha* discloses a food/drink containing casein phosphopeptide ("CPP") and calcium to promote absorption of calcium. See, *Kaisha*, English translation Abstract.

Further, *Shlyankevich* is entirely directed to pharmaceutical compositions and dietary soybean food products for the prevention of osteoporosis. See, *Shlyankevich*, Abstract. *Kirschmann* is entirely directed to a Nutritional Almanac that provides nutritional information for various foods including, for example, cream, eggs, milk, fish, shrimp, etc. At best, *Kirschmann* discloses the content of the essential amino acids in egg whites. See, *Kirschmann*, page 239. The Examiner states that *Kirschmann* discloses "known egg whites weight portions in egg compositions," which the Examiner states is used for "the calculation of the weight ratio of egg whites to calcium as taught by *Kaisha*." See, Advisory Action, page 2, lines 16-18. However, *Kirschmann* fails to even disclose the calcium content of egg whites. As such, it is unclear how the Examiner is using the content of amino acids in egg whites, as disclosed by *Kirschmann*, to calculate the ratio of egg white to calcium of the present claims. Instead, *Kirschmann* merely discloses typical amino acid compositions of egg whites and fails to disclose any information regarding a composition with egg whites, calcium and isoflavones.

For at least the reasons set forth above, Appellants respectfully submit that the cited references fail to disclose each and every element of the present claims and, as such, that the Examiner has failed to establish a *prima facie* case of obviousness.

Accordingly, Appellants respectfully request that the obviousness rejection of Claims 1, 3, 6-11 and 26-27 be reconsidered and withdrawn.

2. The Skilled Artisan Would Have No Reason to Combine the Cited References to Arrive at the Present Claims

Appellants also respectfully submit that the skilled artisan would have no reason to combine the cited references in the absence of hindsight because the cited references are directed to unrelated products that have completely different objectives. Further, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there exists no reason for the skilled artisan to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). This certainly applies here, where the primary reference is directed toward food/drink products having casein phosphopeptides and calcium and the secondary references are directed to pharmaceutical compositions having soybeans and the amino acid content of various foods, respectively.

For example, *Kaisha* discloses food/drink containing CPP to promote the absorption of calcium in a person having low calcium absorption ability. Although *Kaisha* discloses the use of CPP and calcium, *Kaisha* fails to disclose or suggest any isoflavone. Moreover, *Kaisha* fails to disclose the advantageous properties of either egg white or isoflavones for enhancing calcium absorption.

Shlyankevich discloses the use of a soybean diet for prevention of osteoporosis. Nevertheless, *Shlyankevich* fails to disclose the use of any egg white or the advantageous properties of egg white for enhancing calcium absorption. *Kirschmann* discloses the weight of specific egg components/products and does not teach or suggest any advantage for using egg whites with respect to calcium absorption.

Indeed, none of the cited references teaches or suggests the use of egg white for enhancing calcium absorption, especially in combination with an isoflavone or at the claimed range. Rather, at most, *Kaisha* discloses the use of CPP and calcium, while *Kirschmann* merely discloses egg white to list essential amino acids associated with it. Based on *Kaisha*, *Shlyankevich* and *Kirschmann*, the skilled artisan would have no clue that egg white can be used to enhance calcium absorption and would have no reason to "optimize" the weight ratio of egg white/calcium between 20 to 60 in accordance with the present claims. In addition, based on the cited references, the skilled artisan would have no reason to believe that the combination of egg

white and an isoflavone can be used to significantly enhance calcium absorption in accordance with the present claims.

As such, the compositions of the cited references are directed toward completely unrelated products having completely unrelated objectives. Accordingly, the skilled artisan would have no reason to combine the cited references to arrive at the present claims. Further, Appellants respectfully submit that what the Examiner has done here is to apply hindsight reasoning by attempting to selectively piece together teachings of each of the references in an attempt to recreate what the claimed invention discloses. Appellants also submit that if it were proper for the Examiner to simply pick any claim element from any prior art reference to arrive at the present claims simply because the reference suggests the element, then every invention would effectively be rendered obvious. Instead, the skilled artisan must have a reason to combine the cited references to arrive at the present claims. Appellants respectfully submit that such a reason is not present in the instant case.

For at least these reasons, Appellants respectfully submit that the obviousness rejection of Claims 1, 3, 6-11 and 26-27 is improper.

Accordingly, Appellants respectfully request that the obviousness rejection of Claims 1, 3, 6-11 and 26-27 under 35 U.S.C. §103(a) to *Kaisha*, *Shlyankevish*, and *Kirschmann* be reconsidered and withdrawn.

VIII. CONCLUSION

Appellants respectfully submit that the Examiner has failed to establish obviousness under 35 U.S.C. §103 with respect to the present claims. Accordingly, Appellants respectfully submit that the obviousness rejections are erroneous in law and in fact and should, therefore, be reversed by this Board.

The Director is authorized to charge $540 for the Appeal Brief and any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712036-00444 on the account statement.

Respectfully submitted,

K&L GATES LLP

BY _____

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Reg. No. 30,142
Customer No. 29157
Phone No. 312-807-4204

Dated: October 4, 2010

CLAIMS APPENDIX

PENDING CLAIMS ON APPEAL OF U.S. PATENT APPLICATION SERIAL NO. 10/523,767

1. Calcium absorption enhancer comprising as an active ingredient calcium, at least one isoflavone and egg white, wherein the ratio of egg white/calcium is between 20 to 60 by weight.

2. Calcium absorption enhancer according to claim 1 wherein the egg white proteins are in their natural form.

3. Calcium absorption enhancer according to claim 1 wherein the egg white or the egg white proteins contains only ovalbumin, ovotransferrin, and ovomucoid.

6. An orally ingestible composition comprising a calcium absorption enhancer comprising as an active ingredient calcium, at least one isoflavone and egg white, wherein the ratio of egg white/calcium is between 20 to 60 by weight.

7. Orally ingestible composition according to claim 6 wherein the composition is in a form selected from the group consisting of a food product, a dietary supplement, a nutritional supplement and a pharmaceutical.

8. Orally ingestible composition according to claim 6 wherein the proportion of egg white and calcium compared to the total composition is from 0.2 to 100% by weight.

9. Orally ingestible composition according to claim 6 comprising a component selected from the group consisting of prebiotics and functional ingredients.

10. Orally ingestible composition according to claim 6 wherein the food product is in a form selected from the group consisting of a human food product and a pet food product.

11. Orally ingestible composition according to claim 6 wherein the active ingredients are in powder form.

26. Orally ingestible composition according to claim 6 wherein the proportion of egg white and calcium compared to the total composition is from 1 to 99%.

27. Calcium absorption enhancer according to claim 1 wherein the ratio of egg white/calcium is 40.

EVIDENCE APPENDIX

EXHIBIT A: Non-Final Office Action dated July 10, 2009

EXHIBIT B: Final Office Action dated April 19, 2010

EXHIBIT C: Advisory Action dated July 27, 2010

EXHIBIT D: JP 7308172 to Kaisha ("*Kaisha*")

EXHIBIT E: U.S. Patent No. 5,424,331 to Shlyankevich et al. ("*Shlyankevich*")

EXHIBIT F: Nutrition Almanac, 1973 to Kirschmann ("*Kirschmann*")

RELATED PROCEEDINGS APPENDIX

None.

EXHIBIT A

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,767	02/07/2005	Peter Kastenmayer	112701-444	7519

29157 7590 07/10/2009

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EXAMINER	
MEHTA, HONG T	
ART UNIT	PAPER NUMBER
1794	

NOTIFICATION DATE	DELIVERY MODE
07/10/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

Office Action Summary	Application No.	Applicant(s)	
	10/523,767	KASTENMAYER ET AL.	
	Examiner	Art Unit	
	HONG MEHTA	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) *2,4,5,12-25 and 28-32* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,6-11,26 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to applicant's remarks filed on April 1, 2009. Amended claims 1, 3, 6-11, 26 and 27 are under examination.

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1, 3 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knights et al. (US 5,766,330).**

5. **Regarding claims 1 and 27,** Knights et al. disclose calcium absorption enhancer composition comprising an active ingredient calcium (col. 5, lines 47-50; col. 6, lines 54-57) and egg whites (col. 6, lines 8-14) as protein source. Knights et al. disclose a protein content of 25% and calcium content of 34%, (col. 9, lines 22-25, col. 5, Table 1, lines 5-13) with ratio of egg whites/calcium, 25 to 34.

6. Knights et al. and the claims differ in that Knights et al. does not disclose the exact same proportions as recited in the instant claims.

7. However, one of ordinary skill in the art at the time of the inventions was made would have considered the invitation to have been obvious because the compositional proportions taught by Knights et al. overlap the instantly claimed proportions and therefore are considered to establish a *prima facie* case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

8. "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is optimum combination of the percentages", *In re Peterson*, 65 USPQ2d 1379 (CAFC 2003).

9. **Regarding claim 3,** Knights et al. disclose the egg whites (col. 6, lines 8-14). Knights is silent on egg whites containing ovalbumin, ovotransferrin and ovomucoid, however it is inherent that ovalbumin, ovotransferrin and ovomucoid are naturally occurring proteins in egg whites.

10. Claims 6-11, and 26 are rejected are rejected under 35 U.S.C. 103(a) as being unpatentable by Bergenfield et al. (US 6,221,418 B1).

11. **Regarding claim 6,** Bergenfield et al. discloses baked products comprising a dietary supplement (col. 3, lines 23-30) consisting of egg whites (col. 4, lines 52-55) and calcium caseinate (col. 5, lines 1, 11, 20).

12. Bergenfield et al. discloses egg whites in amount by wt. of 28% to 32% and calcium caseinate in the amount by wt. of 39% to 42% (col. 5, lines 11-12).

13. Bergenfield et al. and the claims differ in that Bergenfield does not disclose the exact same proportions as recited in the instant claims.

14. However, one of ordinary skill in the art at the time of the inventions was made would have considered the invitation to have been obvious because the compositional proportions taught by Knights et al. overlap the instantly claimed proportions and therefore are considered to establish a *prima facie* case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

15. "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is optimum combination of the percentages", *In re Peterson*, 65 USPQ2d 1379 (CAFC 2003).

16. **Regarding claim 7 and 10,** Bergenfield discloses orally ingestible composition of a food product (col. 1, lines 9-13; col. 3, lines 25-28 and 60-63). Examiner considers food to be dietary and nutritional supplement to human and/or animal upon consumption

17. **Regarding claim 8 and 26,** Bergenfield teaches orally ingestible composition with proportion of egg white and calcium compared to total composition with calcium amount by wt. ranging 39% to 42% and egg whites in amount by wt. of 28% to 32% (col. 5, lines 11-12; claim 9, col. 8, lines 65-67 and col. 9, lines 1-9).).

18. **Regarding claim 9,** Bergenfield teaches orally ingestible composition with functional ingredients (col. 4, lines 45-52 and 62).

19. **Regarding claim 11,** Bergenfield teaches orally ingestible composition as active ingredients are in powder form (col. 4, lines 37-41, and 53-57).

Response to Arguments

20. Applicant's arguments with respect to claim April 1, 2009 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's argument that Knight et al. does not disclose egg whites as protein source to amended claim 1. Examiner disagrees. Knight et al. discloses eggs (col. 6, line 11) which include egg whites, and egg white (col. 6, line 14) as protein source with calcium.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HONG MEHTA whose telephone number is (571)270-7093. The examiner can normally be reached on Monday thru Thursday, from 7:30 am to 4:30 pm EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

htm

/JENNIFER MCNEIL/

Supervisory Patent Examiner, Art Unit 1794

EXHIBIT B

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,767	02/07/2005	Peter Kastenmayer	3712036-00444	7519

29157 7590 04/19/2010

K&L Gates LLP
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER	
MEHTA, HONG T	
ART UNIT	PAPER NUMBER
1784	

NOTIFICATION DATE	DELIVERY MODE
04/19/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

Office Action Summary	Application No.	Applicant(s)	
	10/523,767	KASTENMAYER ET AL.	
	Examiner	Art Unit	
	HONG MEHTA	1784	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 January 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,6-11,26 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,6-11,26 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *January 22, 2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to applicant's remarks and amendments filed on January 11, 2010. Amended claims 1, 3, 6-11, 26 and 27 are under examination. Claims 4 and 24 are cancelled. Claims 2, 5, 12-23, 25, 28-32 are withdrawn.

Election/Restrictions

Applicant has amended the claims to include non-elected species isoflavones. This limitation was not previously considered since it was considered a non-elected species. New search and consideration of the new limitation of isoflavone in amended claims 1-3, 6-11, 26 and 27 necessitated new grounds of rejections.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1, 3, 6-11, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meiji Seika Kaisha (JP 7308172 A, Abstract translation) in view of Shlyankevich (US 5,424,331) and further evidenced by Kirschmann (Nutrition Almanac, 1973).**

5. **Regarding claims 1, 6, 7, 8, 10, 26 and 17**, Meiji Seika Kaisha discloses a baked cookie composition to promote calcium absorption within a person. The composition comprising 70 grams of egg powder and 6 grams of calcium carbonate. Calcium carbonate has approximately 2.4 grams of calcium in the calcium carbonate. Egg powder is considered to be egg whites and egg yolks. Kirschmann teaches egg compositions comprise 31 grams of whites (64.6%) and 17 grams of yolk (35.4%), thus based upon a given composition of an egg, Meiji Seika Kaisha is considered to disclose egg whites with amount of 45.22 grams. Meiji Seika Kaisha discloses a ratio of egg whites to calcium at range of about 19 (45.22 grams/2.4grams).

6. **With regard to claims 1, 6 and 27**, Meiji does not discloses the exact range of ratio of egg whites to calcium as cited in the instant claims however, it would have been obvious to one of ordinary skill in the art to increase the amount of egg powder in a

cookie formulation depend upon one's preference for texture and amount of added nutrient provided by eggs in cookie food product.

7. Meiji Seika Kaisha is silent on isoflavone in the cookie composition. However, Shlyankevich discloses a dietary composition comprising phytoestrogen (isoflavones) and calcium (col. 3, lines 15-30). Shlyankevich teaches the composition as a dietary supplement for preventing bone disorder such as osteoporosis (col. 2, lines 25-36). Additionally, Shlyankevich discloses dietary compositions comprising phytoestrogen (isoflavones) may be mixed with dietary wafers such as cookies (col. 5, lines 37-41). It would have been obvious to one of ordinary skill in the art to use Shlyankevich's dietary composition as a food additive in Meiji Seika Kaisha's cookie composition because Shlyankevich clearly teaches dietary the supplement comprises isoflavones for preventing bone disorder such as osteoporosis (col. 2, lines 25-36) and is useful with Meiji's cookie formulation for improve calcium absorption within the body.

8. **Regarding claims 3**, Meiji is silent on egg whites containing ovalbumin, ovotransferrin and ovomucoid, however ovalbumin, ovotransferrin and ovomucoid are considered naturally occurring proteins in egg whites.

9. **Regarding claim 9**, Meiji discloses milk, wheat flour, sugar and margarine which are considered functional ingredients.

10. **Regarding claim 11,** Meiji discloses the calcium and egg powder as active ingredients in dry powder form.

Response to Arguments

11. Applicant's arguments with respect to claims 1-3, 6-11, 26 and 27 have been considered but are moot in view of the new ground(s) of rejection. The amendment to the claims necessitated the new grounds of rejection above.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HONG MEHTA whose telephone number is (571)270-7093. The examiner can normally be reached on Monday thru Thursday, from 7:30 am to 4:30 pm EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Htm

/Jennifer C. McNeil/

Supervisory Patent Examiner, Art Unit 1784

Notice of References Cited	Application/Control No. 10/523,767	Applicant(s)/Patent Under Reexamination KASTENMAYER ET AL.	
	Examiner HONG MEHTA	Art Unit 1784	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,424,331 A	06-1995	Shlyankevich, Mark	514/456
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Kirschmann, John. Nutrition Almanac, 1973, McGraw-Hill Book Company. p. 239
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EXHIBIT C

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,767	02/07/2005	Peter Kastenmayer	3712036-00444	7519

29157 7590 07/27/2010

K&L Gates LLP
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER	
MEHTA, HONG T	
ART UNIT	PAPER NUMBER
1784	

NOTIFICATION DATE	DELIVERY MODE
07/27/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

Advisory Action Before the Filing of an Appeal Brief	Application No.	Applicant(s)	
	10/523,767	KASTENMAYER ET AL.	
	Examiner	Art Unit	
	HONG MEHTA	1784	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 12 July 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: *1,3,6-11,26 and 27*.
   Claim(s) withdrawn from consideration: *2,5,12, 25 and 28-32*.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and suffident reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: Please read attached sheet.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/Jennifer C. McNeil/
Supervisory Patent Examiner, Art Unit 1784

/HONG MEHTA/
Examiner, Art Unit 1784

Examiner notes applicant has amended the claims submitted on January 11, 2010 to include non-elected species isoflavones. This limitation was not previously considered since it was considered a non-elected species. Consideration of new limitation of isoflavones in amended claims 1, 3, 6-11 and 27 necessitated new grounds of rejections in final office action dated April 19, 2010.

Applicant argues calcium and isoflavones in parallel with egg white considerably enhances calcium absorption. Applicant's argues unexpected results but have not provided any data or evidence to support this argument.

Applicant argues that the art applied to the claims alone or in combination fails to disclose or suggest a calcium absorption enhancer comprising a weight ratio of egg white/calcium between 20 to 60.

In response to applicant's argument, Kaisha is relied upon for teaching an egg powder which includes egg whites and calcium in a cookie with the advantages of promoting the absorption of calcium in a person of low calcium absorption ('172, Abstract). Kirschmann is relied as evidence of known egg whites weight portions in egg compositions for the calculation of the weight ratio of egg whites to calcium as taught by Kaisha. Kaisha discloses a ratio of egg whites to calcium at about 19. Shylakevich discloses a dietary supplement composition comprising phytosetrogen (isoflavones) and calcium for preventing bone disorders such as osteoporosis disease. Shylackevich discusses osteoporosis is prevented by a daily intake calcium to reduction in bone mass ('331, lines 55-68). It would have been obvious to one of ordinary skill in the art

to use Shylakevich's dietary supplement with isoflavones in Kaisha's cookie composition which includes the egg whites and calcium to promote absorption of calcium for desired health benefits such as ensuring skeletal integrity.

Applicant argues the references does not teach or suggest the use of egg whites for enhancing calcium absorption, especially in combination with an isoflavone or claimed ranges. The reason for combining references does not have to be the same reason as applicant. Shylakevich teaches the benefits of using isoflavones in a dietary supplement and is considered to provide motivation to combine with the food product of Kaisha.

Applicant argues that it would not have been obvious to optimize the ratio of egg whites and calcium. Kaisha discloses a ratio of egg white/calcium of 19. This value is so close as to be considered not patentably distinguished from the prior art and is considered prime facie obviousness. The compositions are in such close proportions to those in prior art that, prima facie, one skilled in the art would have expected them to have the same properties, and must be considered to have been obvious. *Titanium Metals Corporation of America v. Banner*, 227 USPQ 773. Additionally, it would have been obvious to one of ordinary skill in the art to adjust the egg powder including the egg whites in a cookie formulation depending upon one's preference for texture and added nutrient in food product. It is well known in the art that the amount of egg whites in cookies or baked goods affects the texture and mouthfeel of the cookie. It would have been obvious to one of ordinary skill to adjust or optimize the amount of egg whites in

the baked good of Kaisha depending upon the desired consistency and texture in the final product.

/HONG MEHTA/

Examiner, Art Unit 1784

July 15, 2010

/Jennifer C. McNeil/
Supervisory Patent Examiner, Art Unit 1784

EXHIBIT D

XP-002240383

AN - 1996-043960 [05]
AP - JP19950000439 19950106
CPY - MEIJ
DC - B04 D13
FS - CPI
IC - A23L1/304 ; A23L1/305 ; A61K33/06 ; A61K38/17
MC - B04-C01 B04-N02 B14-E11 D03-F06 D03-H01T2
M1 - [01] M423 M781 M903 Q220 V600 V631 V752
PA - (MEIJ) MEIJI SEIKA KAISHA LTD
PN - JP7308172 A 19951128 DW199605 A23L1/305 005pp
PR - JP19940010326 19940201
XA - C1996-014463
XIC - A23L-001/304 ; A23L-001/305 ; A61K-033/06 ; A61K-038/17
AB - J07308172 A food/drink contg. casein phosphopeptide (CPP) is pref. a casein decompsn. product contg. CPP fraction prepd. by reacting trypsin with casein and further taking away its bitterness.
- ADVANTAGE - The absorption of Ca can be promoted in a person of low Ca absorption. The amount to be added can be very low.
- In an example, 100 g sugar, g Ca lactate, 3 g citric acid and 0.5 g pure CPP were dissolved in 500 ml hot water at 45 deg. C and then 10 g conc. apple juice and 1 g of a perfume were mixed to it. Further, 377 ml. of water was added and mixed together and the mixture was filled in a can and sterilized by heating to prepare a canned fruit juice drink. 440 g wheat flour, 240 g sugar, 200 g margarine, 70 g egg powder, 30 g milk, 6 g Ca carbonate, 6.3 g debittered CPP, 2.5 g vanilla essence and 130 ml water were used to prepare a dough. It was spread and formed and baked at 170 to 180 deg. C to prepare cookies. The Ca absorption of women after menopause was increased by CPP.(Dwg.0/0)
IW - FOOD DRINK CONTAIN CASEIN PHOSPHO PEPTIDE PERSON LOW CALCIUM ABSORB PREPARATION REACT TRYPSIN CASEIN REMOVE BITTER
IKW - FOOD DRINK CONTAIN CASEIN PHOSPHO PEPTIDE PERSON LOW CALCIUM ABSORB PREPARATION REACT TRYPSIN CASEIN REMOVE BITTER
NC - 001
OPD - 1994-02-01
ORD - 1995-11-28
PAW - (MEIJ) MEIJI SEIKA KAISHA LTD
TI - A food-drink contg. casein phospho:peptide for persons of low calcium absorption - prepd. by reacting trypsin and casein and removing bitterness

EXHIBIT E

US005424331A

United States Patent [19]

Shlyankevich

[11] Patent Number: 5,424,331

[45] Date of Patent: Jun. 13, 1995

[54] **PHARMACEUTICAL COMPOSITIONS AND DIETARY SOYBEAN FOOD PRODUCTS FOR THE PREVENTION OF OSTEOPOROSIS**

[75] Inventor: **Mark Shlyankevich**, Waterbury, Conn.

[73] Assignee: **Bio-Virus Research Incorporated**, San Matteo, Calif.

[21] Appl. No.: **258,460**

[22] Filed: **Jun. 10, 1994**

[51] Int. Cl.[6] A61K 31/35

[52] U.S. Cl. 514/456; 514/874; 514/455

[58] Field of Search 514/456, 455, 874

[56] References Cited

U.S. PATENT DOCUMENTS

3,864,362	2/1975	Feuer et al.	260/345.2
4,501,754	2/1985	Wechter et al.	514/456
4,960,908	10/1990	Ito et al.	549/403

OTHER PUBLICATIONS

Endocrinology 122:5 (1988) p. 1847.

Journal of Clinical Endocrinology and Metabolism 60:6 (1988) p. 140.

First International Symposium on the Role of Soy in Preventing & Treat Chronic Disease, p. 1–27, Feb./-20–23, 1994.

Soy Intake and Cancer Risk:Review of in Vitro & in Vivo Data: Messina, Persky, Setchell and Barnes (3 pages) Nutrition and Cancer, 1994 (p. 113).

Flavonoids:Biochemical Effects & Therapeutic Applications; Brandi, pp. s3, s7, s8 *Bone and Mineral*, 19 (5 pages) 1992.

New England Journal of Medicine, 14 Apr. 1994, Effects of Vitamin E & Beta Carotene on Incidence of Lung Cancer . . . , (2 pages).

Food & Nutrition Board, National Academy of Sciences, National Research Council, Recommended Dietary Allowances, p. 451 Nutrition Reviews, vol. 50 (1992).

Primary Examiner—Gary E. Hollinden
Assistant Examiner—Brian M. Burn
Attorney, Agent, or Firm—Herbert Dubno; Johathan Myers

[57] ABSTRACT

A composition for the treatment or prevention of osteoporosis, is disclosed, which comprises:

(a) 75 to 200 parts of one or more phytoestrogen compounds;
(b) 0 to 100 parts of dried licorice root extract;
(c) 300 to 600 parts of calcium contained in a biologically acceptable calcium salt;
(d) 70 to 280 parts of magnesium contained in a biologically acceptable magnesium salt;
(e) 4 to 25 parts of zinc contained in a biologically acceptable zinc salt;
(f) 5 to 20 parts of beta-carotene;
(g) 0.005 to 0.010 parts of Vitamin D as cholecalciferol; and
(h) 6 to 12 parts of Vitamin E,

in admixture with a biologically acceptable inert carrier. The new compositions are administered to a mammalian subject as either a pharmaceutical or as a dietary supplement.

10 Claims, No Drawings

PHARMACEUTICAL COMPOSITIONS AND DIETARY SOYBEAN FOOD PRODUCTS FOR THE PREVENTION OF OSTEOPOROSIS

FIELD OF THE INVENTION

This invention relates to new pharmaceutical compositions and dietary soybean food products for the prevention of osteoporosis. More particularly, the invention relates to such pharmaceutical compositions and dietary soybean food products that contain natural phytoestrogens of the isoflavone or coumestan groups.

BACKGROUND OF THE INVENTION

Osteoporosis is recognized as a major public health problem in Western countries, especially among elderly white women. See Cummings, S. R. et al, Epidemiol. Rev., 7:178 to 208 (1985). Postmenopausal osteoporotic fractures affect 1.5 million people each year. About 300,000 new cases of osteoporotic hip, 650,000 of vertebrae, and 200,000 of distal forearm fractures are reported annually in the USA. Mortality in the first year after hip fractures reaches 20%. See Cooper, C. et al, Amer. J. Epidem., 1001 to 1005 (1993) and Riggs, B. L., West. J. Med., 154:63 to 67 (1991). The estimated direct cost for treatment of these patients in the USA exceeds $6 to $10 billion annually. See Holbrook, T. L. et al, Lancet, 2:1046 to 1049 (1988) and the Riggs, B. L. reference cited above. Half of the survivors are unable to walk unassisted and 25% are confined to long term care in a nursing home.

Epidemiological and clinical observations strongly indicate that osteoporosis and fractures are related to aging. See once again Cummings, S. R. et al, Epidemiol. Rev., 7:178 to 208 (1985) and also Cummings, S. R. et al, Arch. Intern. Med., 149:2445 to 2448 (1989) and Ross, P. D. et al, Am. J. Epidem., 133:801 to 809 (1991). Particularly rapid loss of bone mass is noted in the first decade after menopause, and implicates estrogen deficiency as an etiological factor.

One of the first observations by Albright more than 50 years ago noted that 40 out of 42 patients with osteoporotic fractures were postmenopausal women. See Albright, F. et al, J.Am.Med.Ass., 116:2465 to 2474 (1941). Indeed the incidence rate of hip fractures rises dramatically with age after 50, and increases about 3 times after 80; see once again Cummings, S. R. et al, Epidemiol. Rev., 7:178 to 208 (1985). It is estimated that adult white women who, on average, will live to age 80 have a 15% lifetime risk of suffering a hip fracture, but in contrast, a white man who has a 75-year life expectancy has only a 5% lifetime chance of a hip fracture. The incidence of limb fractures rises with age, from approximately 7.3 per thousand to about 40 per thousand at ages 45 and 85, respectively. See Henert, A. M. et al, Am. J. Epidem. 132:123 to 135 (1990).

Prevention is likely to remain the most effective method of dealing with osteoporosis. Estrogens can protect the patient against osteoporosis. Hormone replacement therapy starting shortly after menopause prevents rapid bone loss and leads to reduction in the fracture risk of up to 60%. Unfortunately there are side effects and other risk factors associated with using estrogens in hormone replacement to prevent postmenopausal osteoporosis.

Weak non-steroidal synthetic estrogens, tamoxifen, toremifene, etc., that are used for breast cancer therapy, have a beneficial effect on bone formation. None of these compounds, however, has proven to be satisfactory in treating osteoporosis.

Diet has also been considered in the control of osteoporosis. Most diet recommendations for the prevention or control of osteoporosis center on increasing the intake of calcium, magnesium, Vitamin D, fluorides, and restriction of the amount of salt, caffeine, alcohol, and consumed animal protein. It is known in the traditional Japanese diet that the average intake of soy products for women amounts to more than 55 g/day. Several studies have indicated that the incidence of hip fracture in Japan is considerably lower than in Western countries. In Hawaii, hip fracture rates among persons of Japanese ancestry were approximately half that of Caucasians.

It is well known that the diet in Japan includes intake of large amounts of soy products. According to The Lancet, Vol. 339, p. 1233 (16 May 1992), H. Adlercreutz et al, *Dietary Phytoestrogens and the Menopause in Japan*, the diet high in soy may be the reason why menopausal symptoms are much less frequent in Japan than in Western countries. The Lancet reported that the urine of several Japanese men, women, and children was analyzed and the urine was found to contain a high amount of phytoestrogens. There is no mention or suggestion in this reference, however, of specifically avoiding osteoporosis thanks to a high soy diet.

The phytoestrogens are diphenolic plant compounds that are somewhat related structurally to the mammalian sex hormone: 17-beta-estradiol. See Setchell, K. D. R., et al Am. J. Clin. Nutr., 40:569 to 578 (1984). Two chemical classes of phytoestrogens are abundant in soybeans, total soy products, and soy protein isolates. Those two classes are coumestrol and isoflavones. The latter class includes daidzein, genistein, glycitein, as well as their glycoside and acetylated forms. The level of phytoestrogens in total soybeans and their bioavailability are relatively high, and their metabolism is similar to that of endogenous sex hormones. A diet rich in soybeans may affect estrogen metabolism. See Adlercruetz, H. et al, J. Steroid. Biochem., 24: pp 289 to 296 (1986).

Phytoestrogens and their metabolites interact with specific cell receptors and compete with endogenous hormone molecules [see Folman, Y. et al, J. Endocr., 44:213 to 218 (1969)], but the biological estrogen-like effect of these compounds is relatively weak. See Kaziro, R. et al, J. Endocr., 103:395 to 399 (1984) and Tang, B. Y. et al, J. Endocr. 85:291 to 297 (1980).

Phytoestrogens can induce two different effects in an organism. When the level of endogenous sex hormones is relatively high, the antiestrogenic effect prevails. There are several mechanisms of antiestrogenic activity of phytoestrogens, including feedback inhibition at the hypothalamus and pituitary glands, and competition and blockade of cell receptors. It has been observed that a phytoestrogen- and lignan-rich diet is associated with the reduction of free plasma estradiol, and the risk of breast cancer. See Adlercreutz, H. et al, J. Steroid. Biochem., 27:1135 to 1144 (1987) and Mousavi, Y. et al, Steroids, 58:301 to 304 (1993). On the other hand in postmenopausal women, phytoestrogens can provoke an estrogenic response. See Adlercruetz, H. et al, Lancet, 339:1233 (1992). This dual effect of weak estrogens is perceptible, and well known "partial" antigens such as Tamoxifen have these properties.

OBJECT OF THE INVENTION

The object of the invention is to provide a composition based on soybeans that will inhibit the pathogenic processes of osteoporosis by decreasing bone resorption and delaying the onset of clinical manifestations of the disease in elderly patients, especially postmenopausal women.

SUMMARY OF THE INVENTION

I have found that the following new compositions are highly effective in the prevention of the onset of clinical manifestations of osteoporosis in mammalian subjects, especially postmenopausal females suffering from estrogen deficiency. The compositions contain the following active ingredients expressed in parts by weight, such as milligrams:

(a) 75 to 200 parts of one or more phytoestrogen compounds;
(b) 0 to 100 parts of dried licorice root extract;
(c) 300 to 600 parts of calcium contained in a biologically acceptable calcium salt;
(d) 70 to 280 parts of magnesium contained in a biologically acceptable magnesium salt;
(e) 4 to 25 parts of zinc contained in a biologically acceptable zinc salt;
(f) 5 to 20 parts of beta-carotene;
(g) 0.005 to 0.010 parts of Vitamin D as cholecalciferol; and
(h) 6 to 12 parts of Vitamin E.

The new compositions may also include a non-toxic inert carrier or diluent in admixture with the abovementioned active ingredients. Examples of such non-toxic, inert carriers include wheat starch, and sodium carboxymethyl cellulose.

The amount of phytoestrogens (e.g. isoflavones) administered per day may be 200 mg which is a preferred daily dosage of the abovementioned compositions corresponds to the amount of isoflavones naturally occurring in 50–75 g of raw soybeans. This is the average amount of soybeans consumed daily in an Oriental diet. 200 mg of isoflavones are functionally equivalent to the daily dosage of conjugated steroidal estrogen used in hormone replacement therapy.

The weak estrogenecity of soybean phytoestrogens and their metabolites is beneficial for saving bone mass, and for prevention of osteoporosis and fractures.

The licorice root extract contains biologically active compounds, including water-soluble B complex vitamins, triterpenoids, and flavonoids. The licorice root extract has an estrogen-like hormonal effect, and stimulates interferon production. These properties are beneficial for enhancing bone formation by the osteoblasts.

Including a pharmaceutically acceptable calcium salt in the compositions is one of the most effective ways to facilitate the treatment and prevention of osteoporosis. The daily calcium intake necessary for obtaining a net absorbed calcium in excess of the urinary and dermal calcium losses, and which thereby ensure skeletal integrity, is generally about 1,370 mg for an individual weighing about 70 kg. Controlled clinical trials have shown that in postmenopausal women, bone loss is attenuated by increased calcium intake (more than 1000 mg/day). For prevention and treatment of osteoporosis in symptom-free individuals, the goal of calcium supplementation is to achieve a total daily intake of 2500 mg. While any pharmaceutically acceptable calcium salt may be employed for this purpose, the preferred calcium salt is calcium carbonate.

I wish to point out, however, that in order for the calcium to be successfully absorbed and assimilated a cooperative action is needed between the calcium, other minerals, and vitamins, specifically, magnesium, manganese, zinc, iron, phosphorus, Vitamin A, Vitamin C and Vitamin D.

One of the effects that results from the lack of estrogen during menopause is a deficiency in magnesium. Increasing the subject's intake of magnesium in the form of a pharmaceutically acceptable magnesium salt is an effective approach to deceleration of bone loss. A preferred magnesium salt for this purpose is magnesium oxide.

Zinc is especially important for calcium uptake, protein synthesis, and collagen formation (the organic matrix of bone). Sufficient intake and absorption of zinc is needed to maintain the proper concentrations of Vitamin E in the blood. Daily zinc dosages under 100 mg in a patient weighing about 70 kg enhance the immune response, but daily zinc dosages above that level may actually depress the immune system.

Vitamin A is essential for cell growth and differentiation. The preferred source of Vitamin A is the naturally occurring beta-carotene from fruits and vegetables. A preferred unit dosage of the abovementioned composition contains up to 20 mg. The principal reasons why beta-carotene is the preferred form of the Vitamin A are as follows:

carotenoids, unlike Vitamin A, have unique antioxidant properties, and can trap free radicals such as nascent oxygen; thus the antioxidant properties will retard bone resorption; and

even though the average adult in the United States consumes the RDA level of Vitamin A, less than one-third of the Vitamin A is in the form of plant carotenoids.

Vitamin E is another essential ingredient in the compositions. Vitamin E is an antioxidant that prevents cell damage by inhibiting free radical formation. Besides this property, Vitamin E induces production of transforming growth factor beta by human cells. This factor is a strong inhibitor of bone resorption.

Vitamin D is required for calcium and phosphorus absorption and utilization, bone formation and normal remodeling. It is important in the treatment and prevention of osteoporosis. Dietary Vitamin D supplementation in the form of cholecalciferol is not toxic so long as it does not exceed 150 mcg/day.

There are two classes of phytoestrogens that are especially contemplated to be within the scope of the present invention. Those two classes are the isoflavones and the coumestans. Examples of the isoflavones include daidzein, genistein, glycitein, and their glycosides: daidzin, genistin, and glycitin, as well as acetylated forms of the abovementioned compounds. An example of a coumestan is coumestrol.

The new compositions according to the invention may contain any one or several phytoestrogens in combination. A preferred combination of the phytoestrogens includes: daidzin 120 to 180 parts by weight, genistin 280 to 350 parts by weight, daidzein 80 to 120 parts by weight and genistein 8 to 12 parts by weight. As a possible variant, the combination can include daidzin and genistin in equimolar concentrations, and 11–13% as aglycones.

When the abovementioned compositions are administered to a mammalian subject as a pharmaceutical, they are preferably administered orally in a dose of 6 to 20 mg of active ingredients per kg of body weight. By active ingredients, I do not mean only the phytoestrogens, but the other ingredients mentioned in the compositions as well. The optimum dosage of course depends on the body weight of the subject as well as the severity of the osteoporosis. Such a daily dosage of the compositions will give the subject the needed volume of calcium and phytoestrogen necessary to improve hormonal status and to save bone mass as well as prevent fractures.

When the mammalian subject is a human, the new pharmaceutical compositions are preferably administered as tablets or capsules 3 or 4 times a day, each containing 150 to 400 mg of the total active ingredients or 50 to 70 mg of the phytoestrogens.

The new compositions may also be employed as dietary supplements for mammalian subjects. When the new compositions are employed as dietary supplements, they are preferably orally administered as tablets or capsules. When the mammalian subject is a human, once again the same daily intake of 3 to 4 tablets or capsules, each containing 150 mg to 400 mg of active ingredients is preferred.

There are no restrictions on age and duration for using the new compositions as pharmaceuticals or dietary supplements for preventing osteoporosis. Generally, these compositions will be administered to postmenopausal women who are at least 50 to 55 years of age and who suffer from an estrogen deficiency. It is noted, however, that a reduction in total bone mass often begins before the female patient reaches menopause. Thus the compositions may be given to females who have not as yet reached menopause who already show symptoms of osteoporosis.

When the new compositions are employed as dietary supplements, they may be admixed with the mammalian subject's food rather than given as individual compositions in tablet or capsule form. Dietary wafers and liquid supplements which contain all of the active ingredients of the dietary supplement in unit dosage form are especially contemplated.

I would also like to point out that a soybean diet, and hence the presently claimed compositions, are not contraindicated in males. Osteoporosis effects elderly men also, and the influence of preventative compounds can be helpful.

Through osteoporosis treatment by hormone replacement therapy using the new compositions of the present invention, I have found that soybean dietary intervention can facilitate the conservation of bone mass, or even increase bone density in one or more skeletal areas in as little as 3 to 6 months. It will decrease the risk of fractures in the future, and this decrease will be considerable. The alleviation of bone pain and improvement in biochemical markers will be more quickly apparent in only one month's time.

In perspective, on the basis of developing and assessing the use of a soybean diet for prevention of osteoporosis, it is possible to design special food products for elderly people. Indeed nutritional requirements, especially vitamin requirements, are different for middle age and older adults. The USA RDA recommends higher levels of some vitamins and minerals. Natural dietary phytoestrogens can replace estrogen therapy. The presently disclosed compositions which contain phytoestrogens have the ability to improve hormonal balance, and are highly effective in the treatment of osteoporosis in older women and men, especially women postmenopause.

The following examples are preferred features of the invention:

EXAMPLE 1

The following composition is prepared in the form of a tablet:

(1) soybean isoflavone (phytoestrogens) genistin	75 mg
(2) licorice root extract (dried)	50 mg
(3) calcium carbonate	750 mg
(4) magnesium oxide	160 mg
(5) zinc sulfate	15 mg
(6) beta-carotene	5 mg
(7) Vitamin D (cholecalciferol)	5 mcg
(8) Vitamin E (natural RRR α-tocopherol)	6 mg

with the balance a pharmaceutically acceptable inert carrier.

EXAMPLE 2

The following composition is identical with that of Example 1 except that the 75 mg of genistin is replaced by the 75 mg of the following mixture of phytoestrogens:

daidzin	160 parts
genistin	315 parts
daidzein	97 parts
genistein	9.9 parts.

EXAMPLE 3

The following composition is prepared in the form of a capsule:

soybean coumestrin (phytoestrogen) coumestrol	50 mg
calcium carbonate	300 mg
magnesium oxide	160 mg
zinc sulfate	25 mg
beta-carotene	20 mg
Vitamin D (as cholecalciferol)	5 mcg
Vitamin E (natural RRR α-tocopherol)	12 mg

All contained in a non-toxic gelatin capsule.

What is claimed is:

1. A composition for the treatment or prevention of osteoporosis which comprises:

(a) 75 to 200 parts of one or more phytoestrogen compounds, wherein the phytoestrogen compound is a coumestan or an isoflavone selected from the group consisting of daidzein, genistein, glycitein, daidzin, genistin, glycitin, an acetylated form thereof and mixtures thereof;

(b) 0 to 100 parts of dried licorice root extract;

(c) 300 to 600 parts of calcium contained in a biologically acceptable calcium salt;

(d) 70 to 280 parts of magnesium contained in a biologically acceptable magnesium salt;

(e) 4 to 25 parts of zinc contained in a biologically acceptable zinc salt;

(f) 5 to 20 parts of beta-carotene;

(g) 0.005 to 0.010 parts of Vitamin D as cholecalciferol; and

(h) 6 to 12 parts of Vitamin E,

in admixture with a biologically acceptable inert carrier.

2. The composition for the treatment or prevention of osteoporosis defined in claim 1 wherein the phytoestrogen compound is a coumestan.

3. The composition for the treatment or prevention of osteoporosis defined in claim 1 wherein the mixture of isoflavones includes:

120 to 180 parts by weight of daidzin;

280 to 350 parts of genistin;

80 to 120 parts by weight of daidzein; and

8 to 12 parts by weight of genistein,

4. The composition for the treatment or prevention of osteoporosis defined in claim 2 wherein the coumestan is coumestrol.

5. A method of treating or preventing osteoporosis in a mammalian subject which comprises the step of administering to said subject an amount of the composition defined in claim 1 effective to treat or to prevent osteoporosis.

6. The method of treating or preventing osteoporosis defined in claim 5 wherein the composition is orally administered to the mammalian subject.

7. The method of treating or preventing osteoporosis defined in claim 5 wherein the mammalian subject to which the composition is administered is a postmenopausal female subject.

8. The method of treating or preventing osteoporosis defined in claim 6 wherein the composition is a dietary supplement administered to the mammalian subject as a tablet or capsule.

9. The method of treating or preventing osteoporosis defined in claim 6 wherein the composition is a dietary supplement admixed with the subject's food.

10. A composition for the treatment or prevention of osteoporosis which comprises:

(a) 75 parts by weight of genistin;

(b) 50 parts by weight of dried licorice root extract;

(c) 750 parts by weight of calcium carbonate;

(d) 160 parts by weight of magnesium oxide;

(e) 15 parts by weight of zinc sulfate;

(f) 5 parts by weight of beta-carotene;

(g) 0.005 parts by weight of Vitamin D as cholecalciferol; and

(h) 6 parts by weight of Vitamin E; in combination with a biologically acceptable inert carrier.

* * * * *

EXHIBIT F

NUTRITION ALMANAC

REVISED EDITION

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JOHN D. KIRSCHMANN,
Director

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Food Item	Measure	Weight g	Calories	Protein g	Essential Amino Acids, mg							Men (160 lb)	Women (124 lb)
					TRP	LEU	LYS	MET	PHA	ISL	VAL	THR		
Cream (Cont.)														
Sour	1 oz	30	57	0.8	12	83	65	20*	40	53	58	39	3	4
Egg														
Boiled, poached, or raw	1 med	50	79	6.5	102	559	406	191*	399	420	470	318	27	35
Fried	1 med	50	108	6.2	99	546	397	192*	390	409	459	310	27	34
Scrambled or omelet	1 med	64	116	7.6	112	644	476	215*	407	472	527	355	30	39
White	1 med	31	16	3.4	51	296	204	133*	214	218	262	150	18	24
Yolk	1 med	17	58	2.72	39	235	185	70*	123	171	190	140	10	13
Milk, cow's														
Buttermilk	1 cup	246	90	8.9	90	809	678	188*	433	514	613	384	26	34
Skim, dry, instant	1 cup	64	228	23	320	2,260	1,780	570*	1,095	1,481	1,575	1,073	79	102
Skim, fortified	1 cup	246	89	8.9	137	870	764	235*	470	627	676	451	33	42
Whole, fortified	1 cup	244	159	8.54	118	832	655	202*	403	538	580	386	28	36
Milk, goat, fresh	1 cup	244	163	7.7	94	663	741	156*	289	203	328	515	22	28
Milk, human, fresh	1 oz	30	23	0.3	5	27	19	6*	13	16	18	13	t	t
Yogurt, part skim	1 cup	250	125	4.3	80	842	706	196*	459	536	638	400	27	35
DESSERTS AND SWEETS														
Banana bread	1 slice	49	134	2.4	33	178	92	45*	123	117	119	81	6	8
Doughnut														
Cake	1 avg	33	129	1.52	20	126	55	27*	85	79	78	53	4	5
Raised or yeast	1 avg	33	136	2.1	26	169	74	35*	114	107	106	72	5	6
Raised, jelly-filled	1 avg	85	226	3.4	44	276	120	58*	186	174	172	116	8	10
FISH AND SEAFOODS														
Anchovy														
Canned	3 fillet	12	21	2.3	23	175	202	67*	85	117	122	99	9	12
Paste	1 tsp	7	14	1.4	14	106	123	41*	52	71	74	60	6	7
Bass, fried	1 lb	453	756	96	857	6,513	7,542	2,495*	3,171	4,371	4,542	3,685	345	445
Cod, canned	1 lb	453	385	87	970	6,699	7,655	2,523*	3,216	4,435	4,611	3,742	345	450
Flounder, baked	1 lb	453	915	135	1,359	10,125	11,880	3,915*	4,995	6,885	7,155	5,805	536	699
Haddock, fried	1 lb	453	742	88	888	6,709	7,762	2,556*	3,282	4,530	4,675	3,793	360	456
Herring, pickled	1 lb	453	1,003	91	924	6,930	8,040	2,681*	3,420	4,711	4,866	3,973	367	478
Mackerel, canned	1 lb	453	789	97	957	7,178	8,326	2,775*	3,541	4,785	5,072	4,115	385	497
Perch, yellow, raw	1 lb	453	412	97	883	6,459	7,773	2,563*	3,269	4,502	4,684	3,796	351	457
Pike														
Blue and northern, flesh only	1 lb	453	403	82	830	6,225	7,304	2,407*	3,071	4,233	4,399	3,569	334	431
Walleye, flesh only	1 lb	453	392	86	875	6,562	7,700	2,538*	3,238	4,462	4,638	3,762	353	455
Salmon, pink, canned	1 lb	453	639	93	929	6,967	8,081	2,695*	3,433	4,643	4,819	3,995	374	481
Shrimp														
Canned	1 lb	453	525	110	1,038	8,345	9,662	3,184*	4,063	5,600	5,819	4,721	442	571
Cooked	1 lb	453	989	92	821	6,240	7,225	2,381*	3,038	4,187	4,351	3,530	331	427

*Limiting amino acid.

†Percentages are based on Recommended Dietary Allowances for limiting amino acid of each particular food.